PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH
COLUMBIA

# A Reconnaissance Survey Of Wolf Lake

A. R. Langston and A. R. McLean
1998

PWFWCP Report No. 134

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

**Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave.**
**3rd Floor, Prince George B.C. V2L 3H9**

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: A. R. Langston and A. R. McLean. 1998. A reconnaissance survey of Wolf Lake. Peace/Williston Fish and Wildlife Compensation Program, Report No. 134. 21pp plus appendices.

Author(s): Arne Langston[1] and Allister R. McLean[1]
Address(es): [1] Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave., 3rd Floor
Prince George, B.C. V2L 3H9

105-02889/

# A RECONNAISSANCE SURVEY OF

# WOLF* LAKE

**WATERSHED:** Pine River

**DATE OF SURVEY:** August 12, 13, 1993

**FIELD CREW LEADER:** A.R. McLean

**FIELD ASSISTANT:** A.R. Langston

## PEACE/WILLISTON FISH AND WILDLIFE

## COMPENSATION PROGRAM

B. C. HYDRO

and

MINISTRY OF ENVIRONMENT, LANDS AND PARKS

REPORT PREPARED BY: A.R. Langston

RELEASED BY: _____

Nick Baccante, Regional Fisheries Biologist

*Wolf Lake is an unofficial name registered with the Geographical Names Unit of the Ministry of Environment, Lands and Parks.

**LAKE:** Wolf (Alias)

**SYSTEM NAME:** Unnamed Creek

**A.S.A.P. REFERENCE NO.:**

**SYSTEM NO:** 234-7084-676-301

**DATA ON FILE FOR THIS SURVEY**

| | | | |
|---|---|---|---|
| Location | x | Dissolved 02/Temp. Profiles | x |
| Physical Data | x | Winter Dissolved 02/Temp. Profiles | x |
| Bench Mark | x | Netting Record | x |
| Terrain Features | x | Lake Catch Summary | x |
| Access | x | Individual Fish Data | -- |
| Resorts and Campsites | x | Fish Preserved | -- |
| Other Developments | x | Stomach Analysis | -- |
| Obstructions and Pollutions | x | Scale Reading | -- |
| Special Restrictions | x | Location of Inventory Sites | x |
| Aquatic Plants | x | Photograph Directory | x |
| Wildlife Observations | x | Appendices: | |
| Miscellaneous Comments | x | A: Water Chemistry Analysis | x |
| Lake Drainage | x | B: Tributary Stream Data | x |
| Fisheries Management Comments | x | Bathymetric Map Reduction | x |
| History of Previous Surveys | x | Bathymetric Map | x |
| Water Chemistry Summary | x | | |

**LOCATION**

Location: 44 km south west of Chetwynd
Elevation: 1570 m +/-

U.T.M.: 10.5494.61486

Latitude/Longitude: 55°29'08":122°13'10"
N.T.S. Map No.: 93-0/8
edition 2

Management Unit: 7-22

Drainage: Unnamed outlet C. --> Falling C. --> Pine R. --> Peace R.

**PHYSICAL DATA**

| | | | | | |
|---|---|---|---|---|---|
| Lake Drainage Area: | -- | $km^2$ | Volume: | 723,000 | $m^3$ |
| Water Surface Area: | 102,000 | $m^2$ | Flushing Rate: | -- | |
| Area above 6 m contour: | 46,000 | $m^2$ | Perimeter of Islands: | -- | |
| Shoreline Perimeter: | 1,400 | m | Number of Islands: | 0 | |
| Maximum Depth: | 17.0 | m | Mean Depth: | 7.1 | m |
| Filterable Residue (TDS): | 62 | mg/l | Secchi Reading: | 4.6 | m |

Elevation Source: Contour

Sounding Device: Lowrance X-15
interpolation

**BENCH MARK**

(Iron spike, centre of red circle) located in a 15 cm diameter spruce tree, 1.5 m from the southwest edge of the lake. Bench mark is set 2.0 m above the current water level.
High water mark: lake appears to be at maximum pondage.

**LAKE: Wolf**

**SYSTEM NAME: Unnamed Creek**

**SYSTEM NO: 234-7084-676-301**

**A.S.A.P. REFERENCE NO.:**

**DATA ON FILE FOR THIS SURVEY**

| | | | |
|---|---|---|---|
| Location | x | Dissolved 02/Temp. Profiles | x |
| Physical Data | x | Winter Dissolved 02/Temp. Profiles | x |
| Bench Mark | x | Netting Record | x |
| Terrain Features | x | Lake Catch Summary | x |
| Access | x | Individual Fish Data | -- |
| Resorts and Campsites | x | Fish Preserved | -- |
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| Fisheries Management Comments | x | Bathymetric Map Reduction | x |
| History of Previous Surveys | x | Bathymetric Map | x |
| Water Chemistry Summary | x | | |

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| | | | |
|---|---|---|---|
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| Elevation: | 1570 m +/- | | |
| Latitude/Longitude: | 55°29'08":122°13'10" | U.T.M.: | 10.5494.61486 |
| Management Unit: | 7-22 | N.T.S. Map No.: | 93-0/8 edition 2 |

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| | | | | | |
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| Shoreline Perimeter: | 1,400 | m | Number of Islands: | 0 | |
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| Filterable Residue (TDS): | **62** | mg/l | Secchi Reading: | 4.6 | m |

Sounding Device: Lowrance X-15

Elevation Source: Contour interpolation

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(Iron spike, centre of red circle) located in a 15 cm diameter spruce tree, 1.5 m from the southwest edge of the lake. Bench mark is set 2.0 m above the current water level.

High water mark: lake appears to be at maximum pondage.

WOLF LAKE

MOUNTAIN
THILLS
ROCKY
Wolf Lake
Scale 1:250 000 Echelle
Miles 5
Kilometres 5
20 Miles
20 Kilometres

WOLF LAKE

scale 1:50,000

← Wolf Lake

R O C K Y — M O

Scale 1:50,000 Échelle

## TERRAIN FEATURES

### Immediate Shoreline:

Wolf Lake is treed to waters edge on the north and west shorelines with stunted spruce trees. The south and east shorelines are adjacent to alpine meadows with sporadic exposed bedrock bluffs at the waters edge. Unidentified small shrubs, similar to bog willows, are present primarily along the western shoreline. Numerous unidentified species of wild flowers were observed along the entire perimeter of the lake.

The shoreline slope is moderate to steep on the north and south lines with some sheer rock bluffs at the northeast corner. The west shoreline is gently sloped into an area of marshy drainage into the lake. The eastern shoreline is moderate to steeply sloped in the form of an exposed rock ridge which runs perpendicularly across this small valley, impounding snow melt waters and thereby creating this lake.

Shoreline substrate consists of bedrock, angular boulders. Cobble is present to varying degrees, but most noticeable at the outlet area along the eastern shoreline. The lake bottom drops off moderately to steeply along all shores. Boating access to and from shore is fair with the exception of a few locations where sheer rock bluffs are present.

### Surrounding Country:

Wolf Lake is located in the Hart Ranges, and is nestled on the shoulder of an unnamed mountain peak. At a lake elevation of 1,570 m, the exposed rock windswept peak rises from the edge of the lake a further 200 meters. Alpine meadows spotted with stunted spruce trees, alpine shrubs and numerous wild flowers provide a unique scenic panorama. The view looking east from the outlet at numerous mountain peaks along the horizon below is exceptional.

Wolf Lake is located in the Englemann spruce - subalpine fir biogeoclimatic zone. The area is very close to, and exhibits many characteristics of the Alpine tundra biogeoclimatic zone.

## ACCESS

Directions:

Wolf Lake was accessed via a 15 minute helicopter flight from Silver Sands Lodge, which is located 70 km west of Chetwynd on highway 97.

No vehicle access to the lake is present.

Natural gas exploration (Shell Canada) in the area has created access close to the lake. This access begins 25 km west of Chetwynd on highway 97. Turn onto the Hasler Creek road and travel approximately 45 km to a helicopter staging area. This staging area is approximately 2.5 km west of Wolf Lake. A seismic survey cut line runs over the height of land (approx. 100 m elevation) toward the lake from the staging area. This seismic line passes within 100 m of the north shore of the lake. An alpine meadow at this point allows easy walking to the lake shore.

**Road Type and Conditions:**

No direct road access. Condition of the gravel gas exploration access road is unknown.

Restrictions:

none noted

## RESORTS AND CAMPSITES

None, however a recreation site would be best suited to the northeast and east lake shore areas. A hike in trail could be developed using the existing seismic survey cut line.

## OTHER DEVELOPMENTS

Natural gas exploration occurring at time of survey.

## OBSTRUCTIONS AND POLLUTIONS

Falls/cascades noted along the entire length of the outlet creek.

## SPECIAL RESTRICTIONS

None noted.

## AQUATIC PLANTS

None.

## WILDLIFE OBSERVATIONS

1 grizzly bear
3 mule deer
5 Barrow's goldeneyes (ducks)

## MISCELLANEOUS COMMENTS

Aquatic invertebrates noted along the shoreline.
Lake water has a pale green colour due to suspended matter (glacial flour?) located throughout the water column.
Water temperature evenly mixed, no thermocline.

Bathymetric map: The lake outline is from an enlargement of aerial photograph B.C. 7188 No. 73, flown June **15, 1969**.

## LAKE DRAINAGE

### General:

Wolf Lake has one inlet and one outlet. The outlet flows approximately 5 km east to Falling Creek. Falling Creek then flows 20 km northwest to its confluence with the Pine River.

### Major Systems:

None

### Minor Systems:

Unnamed C. - inlet #1

The inlet drains a series of ponds created by terraces in the rock hill side to the west of the lake. The first 200 m of this inlet (from lake heading upstream) is low lying marshy drainage. Small shrub vegetation is present in and along the stream producing in stream and over stream cover. The inlet has an organic substrate with an average wetted width of 1.1 m, and an average depth of 0.2 m. Water temperature at the time of survey was 6.5 °C.

The inlet affords some juvenile rearing habitat, but no adult or spawning habitat was identified for trout species.

Unnamed C. - outlet #1

This outlet is characterized by a series of small waterfalls and cascades along most of its length until it reaches Falling Creek. The initial 200 m of the outlet was investigated. The average wetted width was 1.0 m., while the average depth was 0.15 m. The substrate consisted of primarily of bedrock, boulder and cobble. Minimal spawning substrate was present in the form of a small amount of broken up angular rock.

Located 5 m downstream of the lake is a 2 m cascade which would prove difficult to upstream fish passage. A 3.5 m waterfall at 60 m, and a 3 m waterfall at 160 m downstream of the lake are barriers to upstream fish passage. Frequent cascades and waterfalls make this inlet virtually unusable by fish.

## FISHERIES MANAGEMENT COMMENTS

One overnight net set and two minnow traps fishing for 16 hours yielded no fish. The lake is therefore believed to be barren of all fish species. Falls which are barriers to upstream fish passage, are present 60 and 160 meters downstream of the lake. Numerous other cascades and falls are present some of which may be barriers to upstream fish passage. Oxygen samples taken during the winter of 1990/91 indicate sufficient levels to support a fish population.

This high altitude lake is suitable for a fish introduction. The low water temperature of this lake will likely result in a stunted population of rainbow trout. It is unknown if the outlet stream is a barrier to downstream fish movement, therefore impacts upon the native fish species downstream must be taken into consideration. Trout species would have little or no reproductive success due to the present lack of suitable spawning habitat. Trout introductions would have to be repeated at regular intervals to maintain a population in the lake.

Due to the remote location of this lake, use of any created fisheries resource is likely to be low.

## HISTORY OF PREVIOUS SURVEYS

### Lake Surveys:

A winter oxygen/temperature series was collected on March 14, 1990 by T. Euchner and R. Tancock, Fish and Wildlife Branch, B.C. Environment, Fort St. John.

### Other Related Surveys:

None known.

**WATER CHEMISTRY SUMMARY** **Limnology Station No. 1**

**Field Conditions:**

| | | | |
|---|---|---|---|
| Date: | August 13 1993 | | |
| Time: | 0945 hrs | Air Temperature: | 12.0 °C |
| Wind Velocity: | low km/hr | Wind Direction: | west |
| Cloud Cover: | 3/10 o.c. | Surface Condition: | light ripple |
| Secchi Disc: | 4.6 m | Water Colour: | yellowish green |

**Method(s) Used:**

| | |
|---|---|
| Dissolved Oxygen: | YSI model 58 oxygen/temperature meter |
| Water Temperature: | YSI model 58 oxygen/temperature meter |
| Air Temperature: | Hand-held alcohol thermometer |
| pH (field): | Digital pH pocket tester |
| H2S (field): | Hach H2S field test kit |
| Laboratory Used: | Zenon Environmental Inc. B.C. Laboratory Services |
| Water Sampler: | Vertical Alpha Water Bottle (Vandorn) |
| Substrate Sampler: | Substrate sample not taken |

**Water Sample Chemistry:** SEAM Site No.: not determined

| | Sampling Depths | |
|---|---|---|
| | Surface (0 m) | Lower (14.5 m) |
| pH (field) | 9.0 | 8.7 |
| pH (lab) | 7.6 | 7.9 |
| Specific Conductance (lab) | 96 umhos/cm | **96** umhos/cm |
| Filterable Residue 105°C (lab) | 62 mg/l | 42 mg/l |
| H2S (field) | -- mg/l | 0 mg/l |

| | |
|---|---|
| Bottom Depth: | 15.5 m |
| Substrate Sample Depth: | - m |

## OXYGEN/TEMPERATURE DATA

### SUMMER

Crew: A. Langston, A. McLean
Date: August 13, 1993.

| DEPTH (m) | 02 (mg/l) | TEMP (°C) |
|---|---|---|
| Surface | 9.6 | 7.2 |
| 1.0 | 9.6 | 7.1 |
| 2.0 | 9.4 | 6.9 |
| 3.0 | 9.4 | 6.9 |
| 4.0 | 9.4 | 6.9 |
| 5.0 | 9.4 | 6.8 |
| 6.0 | 9.4 | 6.8 |
| 7.0 | 9.4 | 6.8 |
| 8.0 | 9.4 | 6.8 |
| 9.0 | 9.2 | 6.8 |
| 10.0 | 9.2 | 6.8 |
| 11.0 | 9.2 | 6.8 |
| 12.0 | 9.2 | 6.7 |
| 13.0 | 8.9 | 6.7 |
| 14.0 | 8.7 | 6.7 |
| 15.0 | 3.1 | 5.4 |
| 15.5 | Bottom | |

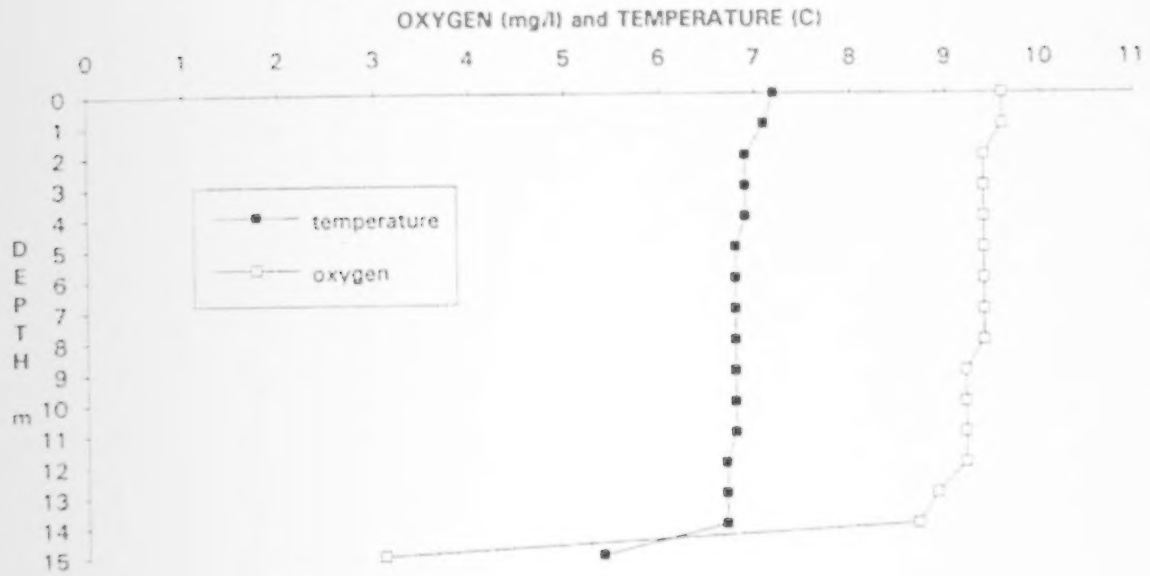
### WINTER

Crew: T. Euchner, R. Tancock
Snow depth: 30 cm
Ice Depth: 150 -170 cm
Date: March 14, 1991

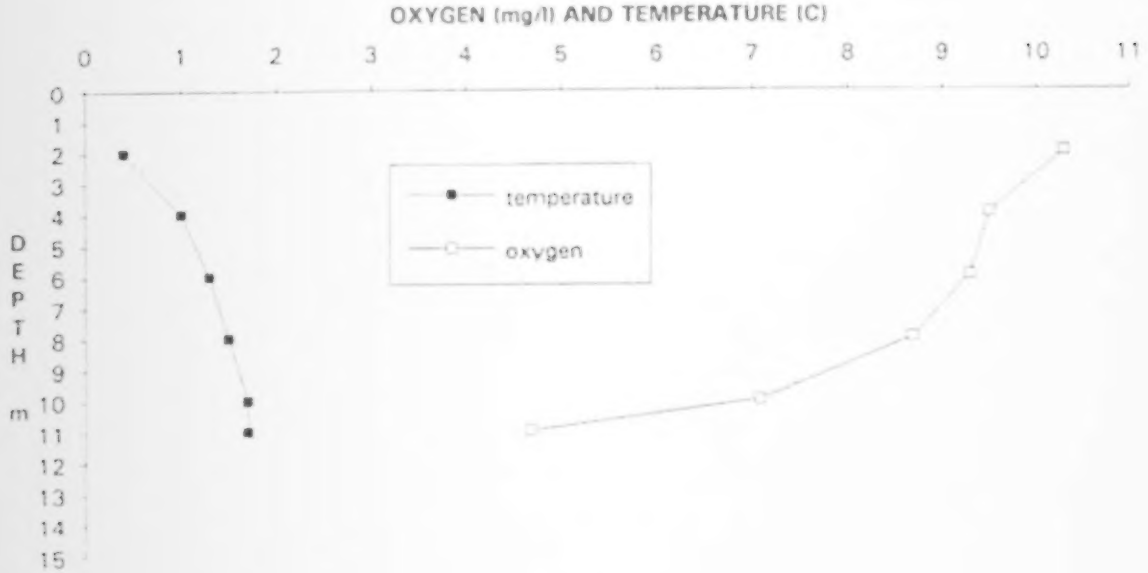
| DEPTH (m) | 02 (mg/l) | TEMP (°C) |
|---|---|---|
| Surface * | -- | -- |
| 2.0 | 10.3 | 0.4 |
| 4.0 | 9.5 | 1.0 |
| 6.0 | 9.3 | 1.3 |
| 8.0 | 8.7 | 1.5 |
| 10.0 | 7.1 | 1.7 |
| 11.0 | 4.7 | 1.7 |
| 11.7 | Bottom | |

* Surface is referenced from top of ice, i.e. surface = top of ice.

## SUMMER OXYGEN/TEMPERATURE PROFILES




## WINTER OXYGEN/TEMPERATURE PROFILES



## NETTING RECORD

Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

### NETTING SITE #1

| | | | |
|---|---|---|---|
| Type: | Sinking monofilament | | |
| Date Set: | August 12, 1993 | Time: | 1830 hrs |
| Date Lifted: | August 13, 1993 | Time: | 0930 hrs |
| Net Dimensions: | Length: 91.4 m | Depth: | 2.4 m |
| Shallow End Mesh Size: | 25 mm | Depth: | 1.0 m |
| | | Substrate: | cobble/boulder |
| Deep End Mesh Size: | 64 mm | Depth: | 7.0 m |
| | | Substrate: | unknown |

**Comments:**

## LAKE CATCH SUMMARY

**Comments:**

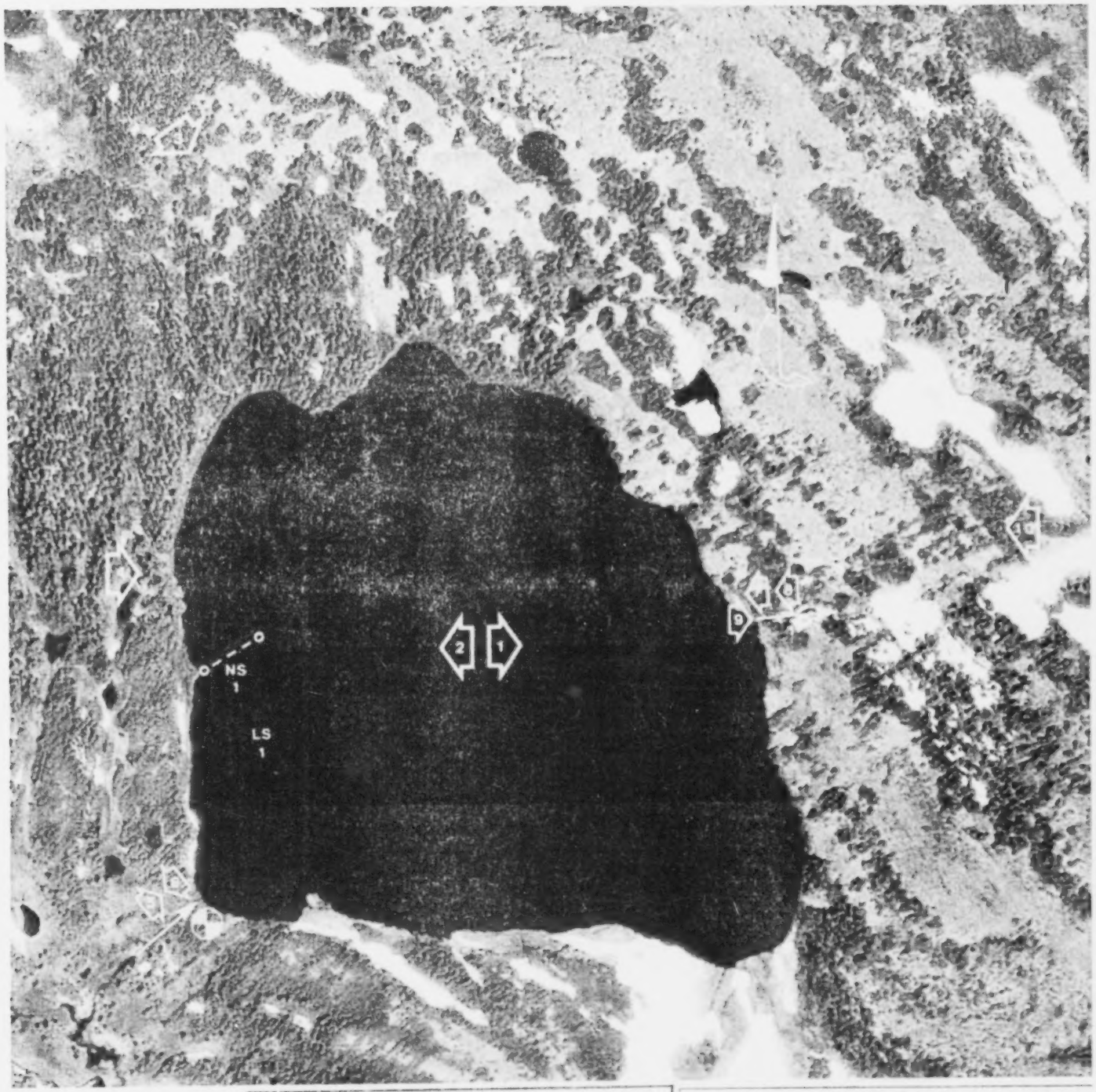
No fish netted.

**Minnow Traps:**

**BAIT:** sardines

| # | HOURS | DEPTH (m) | SUBSTRATE | SPECIES | SIZE RANGE (cm) |
|---|---|---|---|---|---|
| 1 | 16 | 0.5 | cobble/boulder | nil | |
| 2 | 16 | 1.0 | cobble/boulder | nil | |
| | | | | | |

**Comments:**




| | |
|---|---|
| 1 | Plate number, area, and direction |
| 2 | Point sample, number, and location |
| | Bench mark |
| LS 1 | Limno station location and number |
| 0 NS 0 1 | Netting site location and number |
| 1 | Stream flow direction and number |

LOCATION OF INVENTORY SITES
Figure 1
Lake: Wolf
Reference No.: B.C. 7188:073
Reference Date: June, 1969
Scale: 1:1000

## PHOTOGRAPH DIRECTORY

| Negative # | Plate # | Description |
|---|---|---|
| R6:5,6 | 1 | Panoramic view of Wolf Lake looking east. Taken from the middle of the lake. |
| R6:3,4 | 2 | Panoramic view of Wolf Lake looking west. Taken from the middle of the lake. |
| R5:8 | 3 | Aerial view of Wolf Lake looking southwest. |
| R5:12 | 4 | Aerial view of Wolf Lake looking east. |
| R5:21 | 5 | Downstream view of inlet #1. |
| R5:19 | 6 | Upstream view of inlet #1. |
| R5:23 | 7 | Upstream view of outlet looking at 3.5 m cascade/falls. |
| R5:24 | 8 | View of 3.0 m falls located 160 m downstream of the lake on the outlet. |
| R5:25 | 9 | Downstream view of the outlet and surrounding country side. |
| R5:7 | 10 | Aerial view of Wolf Lake looking west. |

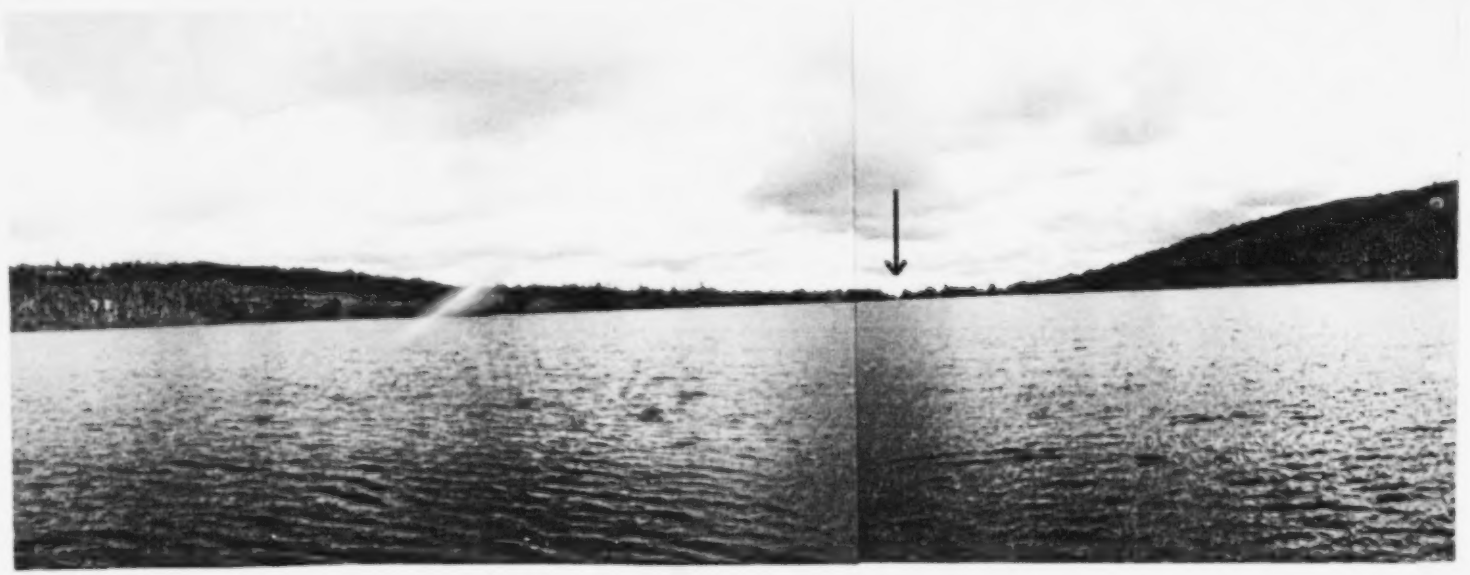


**Plate 1:** Panoramic view looking east, taken from middle of Wolf Lake. (arrow indicates outlet location)

**Plate 2:** Panoramic view looking west, taken from the middle of Wolf Lake. Terraced hills visible in the background.

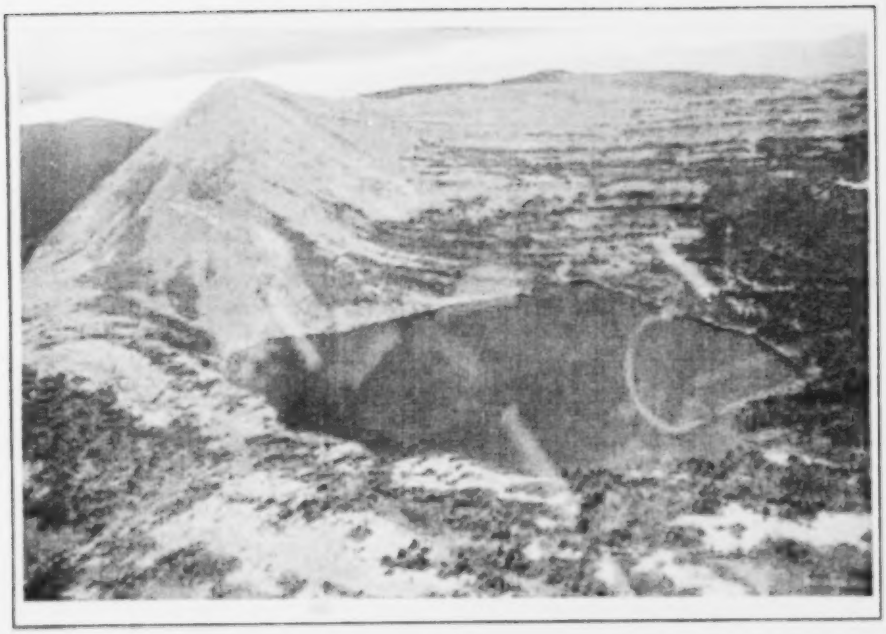


**Plate 3:** Aerial view of Wolf Lake looking southwest. Outlet stream is visible in the lower left. Note the survey trail which passes close to the north edge of lake (right side of photo).

**Plate 4:** Aerial view of Wolf Lake looking east. Note the survey trail passing close to the north edge of the lake.

**Plate 5:** Downstream view of inlet #1 taken 15 m upstream of Wolf Lake.

**Plate 6:** Upstream view of inlet #1 taken 15 m upstream of Wolf Lake.

**Plate 7:**
Upstream view of outlet, 60 m downstream of Wolf Lake. Note stunted spruce trees in the background.

**Plate 8:** View of 3.0 m waterfall located 160 m downstream of the lake on the outlet. This is a barrier to upstream fish migration.

Plate 9: View from the outlet looking downstream (east). Note the rapid elevational change which creates the falls and cascades characteristic of this outlet stream.

Plate 10: Aerial view of Wolf Lake looking west. Note lake outlet in foreground.

# Appendix A

## LABORATORY REPORT

## Water Chemistry Analysis

# ZENON ENVIRONMENTAL LABORATORIES
Certificate of Analysis

## Reported To

FISH - PRINCE GEORGE  Client Code BD

Waste Management Branch
Northern Region
3rd Floor, 1011 4th Avenue
Prince George, BC V2L 3H9

**Submitted By :** ARNE LANGSTON

## Requisition Forms

| | **Zenon ID** |
|---|---|
| Form 10016186 received on 17-AUG-1993 completed on 11-SEP-1993 containing sample(s) | 93018339<br>93018340 |

From sampling site NOSITE WOLF LK

## Remarks :

- All results are blank corrected except for Hi-Res MS data.
- 'MDC' = Minimum Detectable Concentration
- '<' = Less than MDC
- '---' = Not analyzed
- Solids results are based on dry weight except Volatile Organics, TPH and Biota Analyses.
- Organic analyses are not corrected for surrogate recoveries except for Isotope Dilution methods.

**Methods used by Zenon are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 17th Edition, published by the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the B.C. Ministry of Environment.**

# ANALYTICAL REPORT
## Form 10016186

**Sampling site :** NOSITE WOLF LK
**Submitted by :** ARNE LANGSTON

**Zenon ID :** 93018339

| Sparcode | Parameter | | Unit | MDC | Media | Workroute |
|---|---|---|---|---|---|---|
| 00041220 | pH | 7.6(1) | pH units | 0.1 | 02/01 | Automated pH Meter |
| 00111160 | Specific Conductance | 96 | uS/cm | 1 | 02/01 | Cond.Meter Siebold |
| 00081071 | Residue Nonfilt. | < 4 | mg/L | 4 | 02/01 | Grav; Subsamp Buch 105C |
| 007H1033 | Res. Filterable 1.0u | 62 | mg/L | 4 | 02/01 | Grav 1.0 um Filter |
| 01021210 | Alkalinity Total 4.5 | 37.0(1) | mg/L | 0.5 | 02/01 | Automated Electrometer |

**Sample State :** Fresh Water
**Sampled on :** 93/08/13 00:00

---

Result comments and/or text results
(1) Analyzed outside of optimal time frame.

# ANALYTICAL REPORT
## Form 10016186

**Sampling site :** NOSITE WOLF LK
**Submitted by :** ARNE LANGSTON

**Zenon ID :** 93018340

| Sparcode | Parameter | | Unit | MDC | Media | Workroute |
|---|---|---|---|---|---|---|
| 00041220 | pH | 7.9(l) | pH units | 0.1 | 02/01 | Automated pH Meter |
| 00111160 | Specific Conductance | 96 | us/cm | 1 | 02/01 | Cond.Meter Siebold |
| 00081071 | Residue Nonfilt. | < 4 | mg/L | 4 | 02/01 | Grav; Subsamp Buch 105C |
| 007H1033 | Res. Filterable 1.0u | 42 | mg/L | 4 | 02/01 | Grav 1.0 um Filter |
| 01021210 | Alkalinity Total 4.5 | 37.4(l) | mg/L | 0.5 | 02/01 | Automated Electrometer |

**Sample State :** Fresh Water
**Sampled on :** 93/08/12 00:00
**Upper Depth :** 14.5
**Lower Depth :** 14.5

Result comments and/or text results :

(1) Analyzed outside of optimal time frame.

# DETAILED BILLING
## Form 10016186

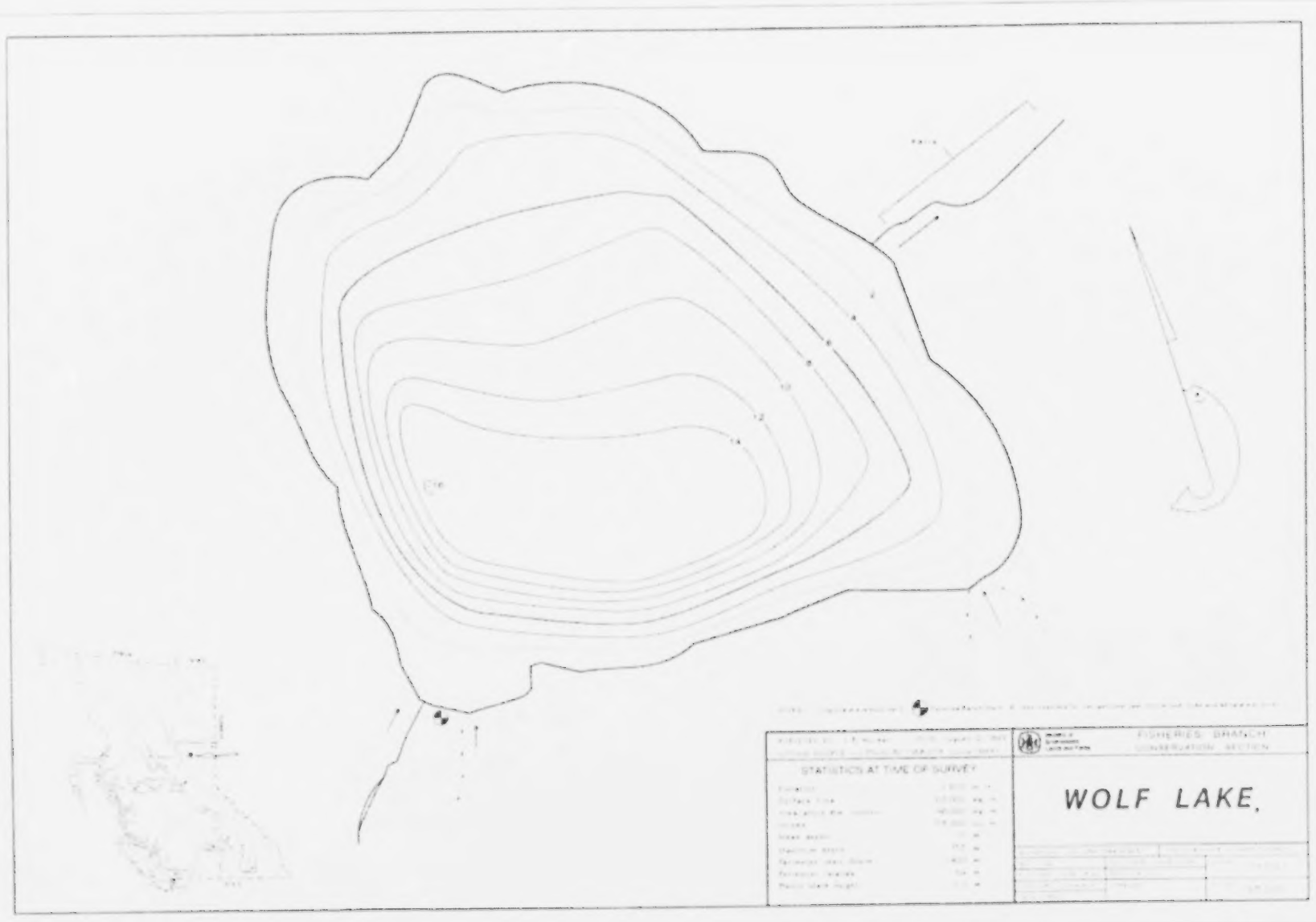
| Sparcode or PKG | Parameter | Secop | Operation | WKU | Price (Regular) | # of tests | WKU | Total-per-item Cost |
|---|---|---|---|---|---|---|---|---|
| 00041220 | pH | 4401 | pH Meter | 3 | $3.86 | YY.... 2 | 6 | $7.71 |
| 00111160 | Specific Conductance | 4404 | Cond.Meter Siebold | 5 | $6.43 | YY.... 2 | 10 | $12.85 |
| 00081071 | Residue Nonfilt. | 4424 | Grav. Buch. 9cm 105C | 14 | $17.99 | YY.... 2 | 28 | $35.98 |
| 007H1033 | Res. Filterable 1.Ou | 4429 | Filt 1.Ou Grav 105C | 14 | $17.99 | YY.... 2 | 28 | $35.98 |
| 01021210 | Alkalinity Total 4.5 | 4402 | Auto.Pot.Tit.St.Acid | 11 | $14.13 | YY.... 2 | 22 | $28.27 |
| | | | Total for form 10016186 is | | | | 94 | $120.79 |

Client code BD : FISH - PRINCE GEORGE
Client type : Ministry contract.

Sampling Site : NOSITE WOLF LK
Submitted by : ARNE LANGSTON

This form, entered on 17-AUG-1993 11:31 has been completed on 11-SEP-1993 00:36
The following records have been entered in the charging file

93-09-11 3R1 BD $120.79 Form 10016186 94 44 - For General Services


STATISTICS AT TIME OF SURVEY
FISHERIES BRANCH
CONSERVATION SECTION
WOLF LAKE.